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Abstract

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ABSTRACT

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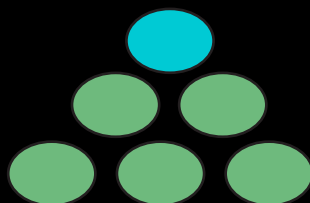
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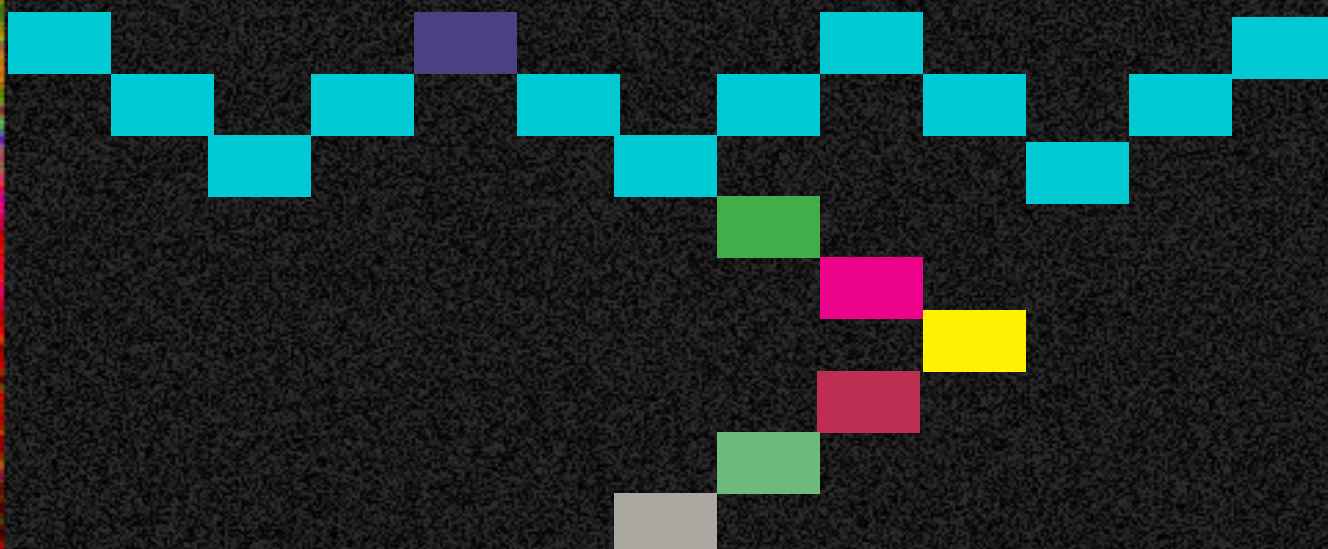
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REVIEW ON MEDICAL APPLICATIONS OF CYCLIC OLEFIN COPOLYMERS (COC)

Aravinthan Gopanna , Mohammed N. Alghamdi and Murthy Chavali

Abstract

The challenges in medical sector inspire for the invention of new medical grade polymers. Polymer provide improved robustness against breakability and better ergonomic, while delivering for many product an adequate stability performance level regarding water/gas permeability as well as extractible/leachable. Cyclic Olefin Copolymers (COC) provides an impressive array of physical and chemical properties that are attractive to medical applications. Cyclic Olefin Copolymers unique characteristics bring a true benefit as well as viable alternative for materials like glass, PVC and PC in medical applications. Cyclic Olefin Copolymers can be used for medical products, diagnostic products, medical device packaging, pharmaceutical blister packaging etc .

Key words: Cyclic Olefin Copolymers, Biocompatibility, Plasma Surface Modification And Blister Packaging.



REVIEW ON BIOGENIC SYNTHESIS OF Iron Oxide (Fe_2O_3), Zinc Oxide (ZnO) and Copper Oxide ($\text{CuO}/\text{Cu}_2\text{O}$) NANOPARTICLES

Kiran Kumar H. A. and Badal Kumar Mandal

Abstract

The synthesis of nano structured materials, especially metal and metal oxide nanoparticles (NPs), has accrued utmost interest over the past decade due to their advanced properties which makes them an important tool for various applications in different areas of science and technology. Green synthesis is the best alternative to the conventional methods which have been widely employed towards the synthesis of metal oxide NPs which includes both chemical and physical methods with various drawbacks such as toxicity, high energy, cost effective and purity. Synthesis and characterization of Fe_2O_3 , ZnO and CuO have been studied extensively due to their advanced applications in various fields. Different naturally available prokaryotic and eukaryotic organisms have been used as reducing and stabilizing agents for the bio-fabrication of the above mentioned metal oxide NPs. This review comprises of information from different reports available on the green synthesis of oxide nanoparticles (NPs) of iron, zinc and copper.

Key Words: Metal Oxide Nanoparticles, Conventional Methods, Applications, Green Synthesis.



A CLASSICAL APPROACH TO THE MELTING OF A NANOROD

Himanshu Kumar Pandey , Sandeep Kumar Singh, Pramendra Ranjan Singh

Abstract

Melting point depression and enhancement of nanomaterials have been found to depend on size, dimension and surface properties of the nanomaterials. Ours is a phenomenological model based on classical considerations regarding melting of nanomaterials. We have considered a nanorod and using a simple minded approach of cohesive binding energy observed that the melting point of the nanorod gets depressed as the size goes down. Further, to illustrate the phenomena, we have adopted a classical thermodynamic approach which is mainly based on Gibbs energy of a nanorod. We have minimized the Gibbs energy for the nanosystem in different phases and calculated and analyzed the results for the melting point of the nanorod. The results of our models are consistent with both of experimental results and other thermodynamic models.

Key Words: Nanomaterials, Nanoparticles , Microelectronics.



APPLICATION OF NANOTECHNOLOGY IN MEDICINE AND HEALTH CARE: AN OVERVIEW

Tabrez Ahmad, Newton Paul and Kavyanjali Shukla

Abstract

Nanomedicine is the application of nanobiotechnologies to medicine. This article starts with the basics of nanobiotechnologies, its applications in molecular diagnostics, nanodiagnostics, and improvements in the discovery, design and delivery of drugs, including nanopharmaceuticals. It will improve biological therapies such as vaccination, cell therapy, cancer therapy and gene therapy. A nanobiotechnology forms the basis of many new devices being developed for medicine and surgery such as nanorobots. It has applications in practically every branch of medicine and such as cancer (nanooncology), neurological disorders (nanoneurology), cardiovascular disorders (nanocardiology), diseases of bones and joints (nanoorthopedics), diseases of the eye (nanoophthalmology), and infectious diseases. Nanobiotechnologies will facilitate the integration of diagnostics with therapeutics and facilitate the development of personalized medicine, i.e. prescription of specific therapeutics best suited for an individual. Many of the developments have already started and within a decade a definite impact will be felt in the practice of medicine.

Key words : Nanomedicine, Vaccination, Nanobiotechnology, Nanorobots, Drugdelivery.



REVIEW ON SYNTHESIS AND APPLICATIONS OF NICKEL NANOPARTICLES

Sai Kumar Tammina and Badal Kumar Mandal

Abstract

Now-a-days nickel nanoparticles (Ni NPs) are gaining attention due to its improved electrical, magnetic and catalytic properties. Currently, Ni NPs are synthesized by chemical reduction, hydrothermal, microemulsion and microwave assisted synthesis methods. In all these methods all researchers have tried to tune the size of Ni NPs, since the electrical, magnetic properties and catalytic activity increase with decreasing size of Ni NPs. The preparation of Ni NPs in large amounts is possible using the reported methods. New methods for synthesis are needed to avoid usage of toxic reducing and stabilizing agents in preparing Ni NPs at industrial scale.

Key Words : Ni Nps, Toxic Reducing Agent, Stabilizing Agent, Chemoselective.



AN OVERVIEW OF SMART MATERIALS IN NANOSCIENCE AND NANOTECHNOLOGY

Yugandhar Parepalli, Sudhakar Reddy Pamanji and Murthy Chavali

Abstract

Design of new materials with a multi-functional capability has become a key research focus in all materials science and engineering discipline in the recent past. A “smart material” is one having a structure at the nano-structural level that responds in a particular and controlled way to influences upon it. These range from magnetically changed materials, to “memory” molecules that return to their original form, to materials that generate an electric charge when pressed, twisted, or warped. In some extent, a structure made by this material or more than one type of this material incorporated with an appropriated sensor system has been well defined as a “smart structure”, that can be used for the implementation of a damage and performance detection strategy for aerospace, civil and mechanical engineering and other applications. Since the last decade, an increasing interest in the development of miniaturized structures and systems, particularly on micro and nanoelectromechanical systems (MEMs and NEMs), and integrated biosensor systems has evolved a new page in the area of smart materials and nanotechnology.

Key Words : Functional Materials, MEMS, NEMS, Titanates, Shape Memory Alloys.



REVIEW ON BIO-BASED POLYMER BEADS AND THEIR APPLICATIONS

S. Balaji and Badal Kumar Mandal

Abstract

The modification of bio-polymeric materials like cellulose, chitosan, agar and agarose are more useful for increasing applications in biochemistry and other areas like chemical engineering and biotechnology with improved properties. Polysaccharides beads show more biocompatibility and sustainability after chemical modification. Cellulose bio-polymer hydrogel beads are extensively used for supporting enzymes entrapment and other potential advantages like bio-fuel cells, bio-sensors and tissue engineering due to their nature of bio-degradability and bio-sensitivity.

Key Words: Bio-Polymeric Materials, Polysaccharides Beads, Cellulose Bio- Polymer Hydrogel Beads.

GREEN SYNTHESIS OF PLATINUM NANOPARTICLES – A REVIEW

Kiran Kumar H. A. and Badal Kumar Mandal

Abstract

Platinum (Pt) is one of the important noble metals and its nano form is used in many chemical, physical, electrical and biological applications. Different chemical and physical methods have been used in the synthesis of Pt nanoparticles (Pt NPs) which are reported to be time consuming, expensive and use of harsh chemicals in synthetic procedures. Since Pt NPs have been used in wide range of applications including human contacting applications, there is an increasing demand for the production of NPs in large scale. In order to come out from above mentioned problem and also to produce green and safer materials in nano science researchers opted green chemistry which involves the use of natural products for the synthesis of metal NPs. In recent years production of metal nanoparticles by green routes has gained lot of attention because of its advantages over other conventional techniques. Synthesis of different metal nanoparticles and metal nano composites using various bioreducing agents such as plant extracts, bacteria, fungi and yeast has been reported. This review describes the advancements in the green synthesis of Pt NPs using different biomolecules and synthetic biocompatible agents.

Key Words : Platinum, Biological Synthesis, Microorganisms, Plant Extracts.

LOW-COST AND ECO-FRIENDLY GREEN METHODS FOR GRAPHENE SYNTHESIS

Sireesh babu Maddinedi and Badal Kumar Mandal

Abstract

Graphene, a god's material, exhibits the outstanding properties which promise different applications in biology, computers, electronics and other engineering, nanoscience and nanotechnology. Various chemical and physical methods have been established for the production of graphene from graphene oxide and graphite, each with their own disadvantages and advantages. However, the usages of this material in different applications greatly depend on their production scale, cost and dispersibility in different solvents. In this prospect, deoxygenation of graphene oxide is a versatile method to obtain a large scale graphene in low cost. Moreover, the development of eco-friendly methods would be an added advantage to obtain a biocompatible graphene with required surface functionalization. This review mainly emphasizes on a variety of low cost, green methods existing in the literature for the synthesis of graphene using plants, microorganisms, microwave and other green reducing agents. The promising advantages of the reported green methods and the possible future research directions also are discussed.

Key words :Reduced Graphene Oxide, Green Synthesis, Functionalized Graphene.



GREEN SYNTHESIS OF REDUCED GRAPHENE OXIDE NOBLE METAL COMPOSITES AND THEIR APPLICATIONS

Kadiyala Nalinikanth and Badal Kumar Mandal

Abstract

Graphene, two-dimensional carbon sheet with one atom thickness and single to several layered thinnest material in universe has created great research interest in many fields like physics, chemistry, material science, and biology. However, pure graphene sheets don't have wide scope of applications and they are restricted to very limited applications. Keeping this base point in mind, many efforts have been put forward for introducing secondary components or functional groups onto the graphene sheet, making these materials as graphene nanocomposites or hybrid materials. Now these materials can be used in day-to-day applications such as catalysts, energy storing devices, sensors, electrochemical and photochemical applications etc., due to the presence of various non-covalent forces such as hydrogen bonding, ionic, amphiphilic, and π - π interactions that are present between the graphene sheets and noble metal nanoparticles. Make these composites to be easily dispersed in various solvents, availability of high surface area and easy accessibility towards charge transfer nature are well developed in these composite materials. The graphene noble metal composite which they are prepared by greener method establishes non-covalent interaction rather than covalent interactions. The graphene nanocomposites act as promising electrode materials for oxygen reduction reactions (ORR), methanol oxidation reactions (MOR) as well as proton transfer membrane fuel cell technologies (PFMC). This review mainly focuses on synthesis techniques of graphene noble metal composites synthesized via greener approaches or techniques with a futuristic recommendation what are the remaining challenges that are to be fulfilled by the upcoming researchers.

Key words: Graphene, Graphene Nanocomposites, Hybrid Materials, Greener Approach.



COMPARATIVE STUDY OF TECHNICAL DOSSIER SUBMISSION IN SOUTH AFRICA AND INDIA FOR ANTIRETROVIRAL DRUGS

Abha Anand, Murthy Chavali, Jagadish P.C., N. Udupa

Abstract

South African drug regulatory authority called MCC i.e. Medicine control council has given several guideline of drugs but not especially for antiretroviral drug for this reason only use of "off-label drugs" in South Africa has become an important part of mainstream, legitimate medical practice worldwide, especially common in oncology, obstetrics, pediatrics, infectious diseases (notably HIV) and rare diseases. Similarly in India CDSCO i.e. Central Drugs Standard Control Organization till the date has been not developed or implemented any specified rule or regulation for antiretroviral drugs in India. National AIDS Control organization provides different guideline for control use of anti retroviral drugs. But still there is lots of difference in technical dossier submission for approval of new drug or generic drug in South Africa. The comparative study of technical dossier submission of both of countries gives an idea to identify the areas where the regulations are aligned and recommend on the proposed framework for Indian market with respect to South African market for antiretroviral drugs.

Key words: Dossier, Antiretroviral, Off-Label Drugs, MRSC, MCC.



ADVANCES IN STRATEGIES FOR PREVENTIVE AND DIAGNOSTIC HEALTH CARE

Laxmi Upadhyaya, Jay Singh, Kavyanjali Shukla, Vishnu Agarwal
and Ravi Prakash Tewari

Abstract

High stress, drug abuse, alcohol consumption, affluence, sedentary lifestyle and lack of exercise are some of the major factors by which our present society is getting afflicted to many diseases. Therefore, a systematic and organized approach to a patient leading to a conclusion is a prerequisite before any medical treatment or intervention can be prescribed. In fact, it would be better to develop techniques that could prevent the disease onset. In this regard, scientists and researchers all over the world are focusing on the development of new strategies for preventive and diagnostic healthcare management. This review presents a brief insight on the new approaches which include sophisticated devices like biosensors, biochips and tissue chips, cell bioimaging and bioreporters. The review also describes different clinical applications, limitations and challenges associated with the preventive and diagnostic healthcare. The later part of the article gives an insight into the nanotechnology in diagnostic medicine and the emergence of new era of predictive medicine.

Key words: Biosensor, Healthcare, Biochip, Cell Bioimaging, Nanotechnology.



POLYMER NANOCOMPOSITES: A BIRD'S-EYE VIEW

Selvin Thomas P, Krishna Prasad Rajan and Murthy Chavali

Abstract

Polymer nanocomposites have been a topic of great research interest all over the world for the scientific community in the last few decades. Numerous publications and patents on the methods of preparation, characterization and applications have been reported. In this short review article, a glimpse of research works related to polymer nanocomposites is described. The main focal points are mechanical properties, barrier properties and electrical properties of the nanocomposites. An insight into the applications of polymer nanocomposites and future perspectives are also given.

Key words: Nanocomposites, Mechanical Properties, Barrier Properties, Flame Retardancy, Electrical Properties, Applications.



FIGHTING CORROSION THE NANO-WAY!

Bhuvaneshwar Dharmalingam And Murthy Chavali

Abstract

The aim of this review was to give the beginner reader exploring the world of nanotechnology in in the field of corrosion, by discussing a few important works on exploring the potential of graphene and popular nano-scale coatings as a corrosion resistant coating on metals and alloys. It is intended that the information condensed here would be useful as a good point of start for a literature survey for the eager beginner and also a valuable tool for the designs of future.

Keywords : Corrosion, Graphene, Passive Layer, Coatings.



POLYSACCHARIDE NANOPARTICLES BASED DRUG DELIVERY –AN OVERVIEW

Yugandhar Parepalli, Muthukrishnan Chellappa, Sudhakar Reddy Pamanji and Murthy Chavali

Abstract

With considerable research interest in the area of drug delivery systems, using nanoparticles (NPs) as carriers for small and large molecules for therapeutic macromolecules such as antigens providing advanced biomedical research tools based on polymeric or inorganic formulations or a combination of both. These NPs have potential to be used in diagnostic test assays for early detection of diseases to serve as tools for noninvasive imaging and drug development, and to be used as targeted drug delivery systems to minimize secondary systemic negative effects. Polysaccharides seem to be the most promising materials in the preparation of nanometeric carriers. In this overview the newest developments in the preparation of polysaccharides-based nanoparticles have been discussed particularly about the structure, molecular formula and source of some of the significant polysaccharides for nanoparticle based drug delivery and their methods of preparations.

Keywords : Polysaccharides, Nanoparticle, Drug Delivery, Characterization .



THERMOCHEMICAL PRODUCTION OF HYDROGEN USING CATALYSTS AS A UNIVERSAL FUEL UTILIZING SOLAR ENERGY

Lekshmi Gangadhar, Venugopalan Pooloth, Murthy Chavali

Abstract

The choice of water as raw material to produce hydrogen using sun light gives the impression of an ideal novel approach to supply clean energy. Hydrogen is the most abundant element and cleanest fuel in the universe. But pure hydrogen does not exist naturally on Earth and therefore must be manufactured. Although photovoltaic cells have great potential for supplying carbon-free energy, they suffer from the lack of an efficient and cost-effective energy storage process that can supply energy for transportation and night time use. A direct way to convert solar energy into chemical fuels would solve this problem. A photo-activated catalyst has ability to form both hydrogen and oxygen from water without the need to add a consumable donor. Storing solar energy by splitting water into hydrogen and oxygen has been considered as a promising idea.

Keywords : Water Splitting, Solar Energy, Hydrogen, Catalyst.



COMPLEX IMPEDANCE SPECTROSCOPY STUDIES ON PZT (52/48) CERAMICS

M. Prabu, I. B. Shameem Banu, Mr. Niranjana Prakash and Murthy Chavali

Abstract

Perovskite Lead Zirconate Titanate (PZT) ceramics with the composition of $\text{Pb}(\text{ZrO}_{.52}\text{TiO}_{.48})\text{O}_3$ were prepared via sol-gel route. The synthesized PZT powders were calcined at different temperatures. The X-ray powder diffraction studies of the prepared powders reveal the formation of single-phase perovskite PZT compound with tetragonal structure. The surface morphological features of the sample were studied using a scanning electron microscope (SEM). The electrical properties of the prepared ceramics were investigated as a function of both temperature (from 25 °C to 500 °C) and frequency (from 100 Hz to 1 MHz) using complex impedance spectroscopy (CIS).

Keywords : Ferroelectric Materials; Perovskite Lead Zirconate Titanate; Sol-Gel; X-Ray Diffraction; Pyrochlore.



CHARACTERIZATION OF FEW LAYERED GRAPHENE OXIDE PREPARED THROUGH CHEMICAL EXFOLIATION

M. Prabu , I. B. Shameem Banu
K. Ravichandran, Wu Ren-Jang and Murthy Chavali

Abstract

Nano graphene oxide was synthesized through chemical exfoliation known as modified Hummers method. The hydrophilic, yellow colored solution was evident for higher degree of oxidation. The formation of oxygen containing functional was analyzed using FTIR and the π electron excitation was observed at 230 nm using UV-Visible spectra. Functional groups and their influence on its structure were analyzed using X-ray diffraction and thermogravimetric analysis. The surface and morphology of the layered graphene oxide were studied using Atomic Force Microscope and Transmission Electron Microscope. In future, the graphene oxide will be the promising material in wide range of application including electronics and nanomedicine.

Keywords : Atomic Force Microscope, Chemical Exfoliation, Graphene Oxide, Transmission Electron Microscope, Thermal Analysis.



PHYSICAL CHARACTERIZATION OF TEOS BASED SOL-GELS AS OPTICAL BIO SENSORS

Mansoor Ani Najeeb and Murthy Chavali

Abstract

Prostate-specific antigen (PSA) is the best serum marker currently available for the detection of prostate Cancer. A new optical biosensor was realized and characterised for PSA[1]. It detects the molecular interaction specific to the analyte using suitable transduction systems viz potentiometric, amperometric, piezoelectric and optical. Sol-gel-derived materials can be exploited for the manufacturing of various optoelectronic devices, including sensors optodes and their protective layers, as well as other kinds of coatings [2]. One of the objectives of present study is to explicate the changes in the internal environment of the sol-gel.

Keywords : Sol-Gel, Prostate Cancer, Prostate Specific Antigen, Thin Film, TEOS.

SYNTHESIS AND APPLICATIONS OF MAGNETIC COBALT NANOPARTICLES - A CRITICAL REVIEW

Badal Kumar Mandal and Prerna Sen

Abstract

This review article aims to highlight on i) methods available in literature for synthesise of magnetic cobalt nanoparticles (Co NPs) in its pure form or associated with other elements, ii) comparative analysis of different available techniques like thermal decomposition, wet chemical method, solvothermal, pyrolysis, ion implantation, chemical reduction, micro emulsion, chemical vaporization, polyol, hydrothermal, pulse lazer, electroless deposition for startup laboratory synthesis of Co NPs, iii) morphology variation of Co NPs synthesized by different techniques, iv) how magnetic properties vary on methods of preparation, v) different applications of Co NPs, and vi) focusing where further research needed to come up with novel strategies.

Keywords : Cobalt, Nanoparticles, Magnetic, Review .



WATER POLLUTION AND NANOTECHNOLOGY VIEWS FROM AN APPLIED RESEARCH

Tabrez Ahmad, Kavyanjali Shukla and Sandeep Bajpai

Abstract

Securing and managing access to clean water is a challenge both for developing and for more economically developed countries. This article reports on the key issues of water pollution, some important technologies for water purification and resource management, nanotechnology, water, industries and the key challenges involving findings from discussions with stakeholders. It is intended to address policy issues faced by both developed and developing countries. The research article also identifies policy recommendations for consideration and adoption. While potential ways for nanotechnology to address the global challenges are the focus of this article, it is essential that that proposition be placed in context. Critical issues for the provision and management of clean water are not technological alone. Economic and social aspects are of great importance and are the subject of many other studies, for example those completed and ongoing under the OECD Horizontal Programme on Water (OECD, 2010a). However, technologies such as nanotechnology may provide complementary solutions to the water problem in addition to the technological solutions already commercially available. Nanotechnology has been in use as a conventional water treatment for many years – although until recently the term nanotechnology was not commonly used. Enhancements to existing treatments and novel approaches are both now leading to changes in water treatment systems, albeit some still at the experimental stages. Some technologies are also being adapted from other sectors such as healthcare. The high surface areas and high throughputs of nonmaterials are being investigated.

Keywords: Water Pollution And Nanotechnology, Water Resources Planning, Drinking Water.



NANOTECHNOLOGY AND ENVIRONMENT : A Mini Review

Sandeep Bajpai, Kavyanjali Shukla, Tabrez Ahmad and Madhu Tripathi

Abstract

Nanotechnology has a significant role in environmental engineering and science. Nanoproducts can be developed having potential for social, economic and environmental benefits such as saving materials and energy as well as advancement in detection and remediation of environmental pollution. Nanotechnology based solutions may also help in reduction and prevention of pollution and toxic emission at source. At nanoscale many particles demonstrate impressive capabilities to remediate pollutants. Nanostructured materials are used as biosensors for monitoring and detection of hazardous compounds. Environmental nanotechnology with new innovations can reach new horizon in remediating and treating the contaminants to acceptable limits. Many potential benefits of nanotechnology have been identified by researchers and scientists in the field of environment, medicine and industry but the future of nanotechnology might bring innovations that can answer many existing scientific questions. The present paper highlights significance of nanotechnology in treating and remediating current environmental problems.

Keywords: Nanotechnology, Remediation, Nanomaterials, Environmental Problems.

OPTICAL PROPERTIES OF BULK AND DOPED ZINC SULFIDE NANOCRYSTALS

Archana Srivastava

Abstract

The II- VI group semiconductors are of great importance due to their applications in various opto-electronic devices. Manganese doped ZnS nanoparticles (ZnS:Mn) with varying concentration of capping agent as well as of Mn²⁺ were synthesized by chemical precipitation method at room temperature. The optical properties get modified dramatically due to confinement of charge carriers within the nanoparticles. The optical absorption studies show that the absorption edge shifts towards blue region as the capping agent concentration is increased indicating that the effective band gap energy increases with decreasing particle size while with the change in doping concentration no variation was observed in the absorption spectra.

Keywords: ZnS, Mn Nanoparticles, SEM, Luminescence, Optical Properties.



MICROEMULSIONS: A POTENTIAL MEDIUM FOR ORGANIC SYNTHESIS

Khushwinder Kaur

Abstract

The development of new or enhanced analytical methodologies based on the use of microheterogeneous systems is a very active area of current research. The use of organized surfactant molecular assemblies, such as micelles, reverse micelles and microemulsions, in synthetic chemistry is steadily increasing because it is a greener route and results in a greatly improved analytical performance, in terms of selectivity, sensitivity and experimental convenience. This review demonstrates that how microemulsions can be a useful for (i) overcoming reactant incompatibility, (ii) speeding up reactions of one polar and one apolar reactant (microemulsion catalysis), and (iii) inducing regiospecificity.

Keywords: Microheterogeneous Reaction Media, Microemulsions, Surfactants, Pseudo-Phase Model, Water-Oil-Interface Properties, Reaction Kinetics.



NANOSPHERES CHITOSAN AS A TARGETED DRUG DELIVERY SYSTEM

Sarvesh Kumar Pathak, Laxmi Upadhyaya, Ravi Prakash Tewari, Sandeep Kumar Pathak, Ved Kumar Mishra

Abstract

Biodegradable nanospheres carriers, have important potential applications for administration of therapeutic molecules. Chitosan (CS) based nanospheres have attracted a lot of attention upon their biological properties such as biodegradability, biocompatibility, bioadhesivity and can reduce systemic side effects and allow for more efficient use of the drug. chitosan is a natural polymer obtained by deacetylation of chitin. After cellulose chitin is the second most abundant polysaccharide in nature. In the present study deals with the formulation and evaluation of surfactant coated and uncoated chitosan nanospheres and its various uses.

Keywords: Chitosan , Formulation And Evaluation , Nanospheres.



NANOTECHNOLOGY AND EMERGING TRENDS IN DAIRY FOODS: THE INSIDE STORY TO FOOD ADDITIVES AND INGREDIENTS

Kavyanjali Shukia

Abstract

Nanotechnology has the potential to replace several existing technologies especially in relation to the dairy and food science areas. Future dairy foods will not only be a good source of nutrients with excellent sensory properties, but they will also contribute to human health and wellness. This document is an attempt to throw light on some of the inside mechanisms and components involved with respect to the qualitative parameters of dairy foods (ie; food ingredients and additives). Some of the critical challenges, including discovering of beneficial compounds, establishing optimal intake levels, developing adequate food delivering matrix and product formulation including the safety of the products are the areas that need to be focused.

Keywords: Nanotechnology, Nanomaterials, Food And Dairy Processing, Nanocapsules, Nanotubes, Nanoceuticals, Nanosensors, Nanoemulsions, Food Quality And Nanoapproaches.



OPTICAL PROPERTIES OF DC MAGNETRON SPUTTERED CdO THIN FILMS

P. Dhivya, P. Deepak Raj and M. Sridharan

Abstract

Cadmium oxide (CdO) thin films were deposited on to well-cleaned glass substrates by reactive dc magnetron sputtering. The deposited films were investigated for their optical properties and surface properties. The field emission scanning electron microscope shows the average grain of the CdO thin film was ~ 50 nm. The optical band gap energy determined by Tauc's method was 2.38 eV. Thickness of the film was 165 nm as analyzed by the profilometer. The average excitation energy and dispersion energy for electronic transitions were calculated.

Keywords: CdO, Thin Film, Magnetron Sputtering, Optical Properties.



PANi FILMS FOR ROOM TEMPERATURE AMMONIA SENSING

R. Venicatesan, P. Deepak Raj, P. Dhivya and M. Sridharan

Abstract

Polyaniline (PANi) thin films were studied for its use as room temperature ammonia sensor. There are many areas which require sensors to detect the ammonia such as environmental analysis, industries, medical application etc. In the present study, PANi thin films were deposited over glass substrate using thermal evaporation technique at different deposition parameters. The optical transmittance value was 95 % and it has sharp absorbance at 428 nm. The film thicknesses were around 760 nm. Fourier transform infrared spectra (FT-IR) shows the presence of amino group and the retention of polymeric chain. The surface of the prepared PANi films is smooth and uniform as analyzed by field emission scanning electron microscopy (FE-SEM). The PANi films shows the response and recovery time as 2-3 min and 2-5 min respectively towards ammonia with a sensitivity of 99.6 %.

Keywords: PANi, Thin Films, Thermal Evaporation, Xrd, Ammonia Sensor.



STUDIES ON CURCUMIN LOADED SILK FIBROIN THIN FILMS

Varshini Vishwanath and M. Sridharan

Abstract

In the present study the drug release properties of the curcumin loaded silk fibroin films were discussed aiming at curing of cataract. Silk fibroin films were coated on to thoroughly cleaned glass substrates using the conventional spin coating technique. The concentration of the silk fibroin extract and the spinning speed are systematically varied in order to obtain films with different properties. Curcumin was loaded in to the films at different concentrations and the drug incorporated silk films were characterized for their optical transparency and morphological properties. The optical transparency of the curcumin loaded silk films were around 95 – 99 % which is most suitable for contact lenses. The anti-oxidant potential of the drug loaded films were also evaluated by hydrogen peroxide scavenging activity assay.

Keywords: Silk Film, Spin Coating, Optical Properties, Drug Release

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